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EXAMINER	
BODDIE, WILLIAM	

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2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/691,312	LEE ET AL.	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 16-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, August 2nd, 2007 the Applicants amended claims 1-5, 12, 16, 19 and 21-22. Currently claims 1-14 and 16-23 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 2nd, 2007 has been entered.

Response to Arguments

3. Applicant's arguments filed August 2nd, 2007 have been fully considered but they are not persuasive.

4. On pages 6-9 of the remarks, the Applicants traverse the rejection of claims 1-14 and 16-23. Specifically the Applicants argue that none of the currently cited art teaches the newly added limitations.

5. The Examiner respectfully disagrees. All the newly added limitations are similar in scope, in that they call for the compensation to include a new second color being supplied. It seems clear to the Examiner that Yui clearly discloses, supplying additional colors after compensating for a first color from the flow chart figures of Yui.

6. Please note that the newly added claim limitations have also been addressed below in the claim rejections.

Claim Objections

7. Claim 1 is objected to because of the following informalities: line 9 of the claim states "that retrieves a grey scale." The spelling of "grey" is inconsistent with all other mentions of "gray scale." Appropriate correction is required.

8. Claim 19 is objected to because of the following informalities: lines 10 and 11 both state "grey scale." The spelling of "grey" is inconsistent with all other mentions of "gray scale." Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 2 recites the limitation "the displayable color" in line 2. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 12 recites the limitation "the first displayable color" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 19 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Yui (US 5,677,741).

With respect to claim 19, Yui discloses, a method of driving a display device (6 in fig. 1), comprising:

receiving image information (1 in fig. 4), the image information including a gray scale value corresponding to a first color (red; S4 in fig. 2a) displayable by the display device (input data in fig. 6);

determining whether the gray scale value is greater than a predetermined corresponding gray scale level at which the first color is displayable by the display device (col. 2, lines 43-45; also note the color space comparisons made by the controller in col. 4, lines 39-67);

applying the image information to the display device if it is determined the gray scale value is not greater than the predetermined corresponding gray scale level (col. 4, line 59 - col. 5, line 11); and

compensating the image information if it is determined the gray scale value is great than the predetermined corresponding gray scale level (col. 5, lines 5-11), wherein compensating the image information includes compensating a grey scale value for the first color displayable by the display device (S5 in fig. 2a) and supplying a grey scale value for a second color (green, s6 in fig. 2a) displayable by the display device (col. 4, line 48 – col. 5, line 11).

With respect to claim 21, Yui discloses, the method of claim 19, wherein the first color is at least one of a red, green, and blue color (clear from figs. 6c1-2).

With respect to claim 22, Yui discloses, the method of claim 19 (see above), wherein the predetermined corresponding gray scale level corresponds to a gray scale

level of the first color displayable by the display device, wherein the color is displayable by the display device, wherein the color is displayable at a reduced color reproducibility (col. 4, lines 64-67).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 1-10 and 12-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786).

With respect to claim 1, Yui discloses, a display device (6 in fig. 1), comprising:

a display panel (6 in fig. 4),

a lookup table (9 in fig. 4) to store a gray scale value (output data in figs. 6a2-c2; col. 3, lines 58-65) corresponding to a predetermined grayscale level (input data in figs. 6a2-6c2; col. 3, lines 33-58) of a first displayable color (red for example in fig. 2a);

a data processing unit (3 and 7 in fig. 4) that retrieves a grey scale value from the lookup table using input data for the first displayable color (display profile and lookup table are retrieved to determine the display color space; col. 4, lines 33-35), that determines from the retrieved gray scale value whether color reproducibility for the first displayable color is reduced (this information is compared with the host color space input data; col. 4, lines 26-33), and that based on the determination compensates the input data for the first displayable color (figs. 5a-c disclose the different determinations;

col. 4, lines 39-67 disclose the compensation for each determination) and supplies gray scale data for a second displayable color to produce compensated image information (s6 in fig. 2a for example); and

a data driving unit (5 in fig. 1) for receiving the compensated image information and for applying the compensated image information to the display panel (col. 2, lines 45-48).

Yui does not expressly disclose, that the display panel is a LCD panel with the requisite control circuitry.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48);

a gate driving unit to apply scan signals to the plurality of gate lines (5 in fig. 1).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 2, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the predetermined gray scale level corresponds to a gray scale level of the displayable color prior to a reduction in a reproducibility of the first displayable color (clear from figs. 6a-c; also note col. 4, lines 57-67).

With respect to claim 3, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the stored gray scale value is a maximum gray scale value,

wherein the maximum gray scale value is the gray scale value corresponding to the maximum gray scale level displayable by the LCD panel for which the color reproducibility of the first displayable color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel).

With respect to claim 4, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the first displayable color includes a blue color (clear from figs. 6c1-2).

With respect to claim 5, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the first displayable color is displayable at a plurality of grayscale levels (as a result of the clipping, there is clearly a displayable color that is displayable at a plurality of grayscale levels).

With respect to claim 6, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the lookup table stores grayscale values of a blue color (clear from figs. 6c1-2).

With respect to claim 7, Yui and Kimura disclose, the device of claim 6 (see above).

Yui does not expressly disclose the use of a 64 gray scale levels.

Kimura discloses, a lookup table that stores gray scale values each corresponding to one of 64 gray scale levels of a blue color (col. 4, lines 38-44; and col. 1, lines 52-56).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the 256 level gray scale of Yui with the 64 level gray scale of Kimura for the benefit of cost.

With respect to claims 8 and 9, Yui and Kimura disclose, the device of claim 7 (see above).

While Yui discloses a 256 level gray scale instead of a 64 level gray scale, as shown above it would have been obvious to use a 64 level gray scale.

It is clear from figures 6A-2-6C-2 of Yui that once the input gray scale levels reach a certain level (based on the reproducibility of the device), that level is maintained until the maximum gray scale level.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 51st gray scale level. If the color reproducibility required

that the gray scale be clipped at the 51st level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 51st level in the current invention, there does not appear to be any reason for specifically selecting the 51st level versus the 50th or 49th levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claims 8 and 9.

With respect to claim 10, Yui and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the lookup table stores gray scale values of blue, red and green colors (clear from figs. 6a2-c2).

With respect to claim 12, Yui discloses, a method for improving a color reproducibility (fig. 2) of a display device (6 in fig. 4), comprising:

increasing a gray scale value of at least one of a red (R), green (G), and blue (B) color (clear from differences from fig. 6a1-c1 to fig. 6a2-c2);

detecting a grayscale value at which a color reproducibility of the LCD device is reduced (col. 4, lines 59-67; also see fig. 6a1-c2);

storing a correspondence of the detected gray scale value and a predetermined gray scale level of a displayable color (col. 5, lines 1-5);

compensating a received image information, the received image information including the detected gray scale value (col. 4, lines 26-38) for the displayable color and

retrieved gray scale values for at least one other color to enhance the reproducibility of the first displayable color (clear from figs. 5a-c that all of the colors, R,G,B are analyzed); and

applying the compensated image information to the display device (6 in fig. 4), the compensated image information including the maximum gray scale value,

wherein the maximum gray scale value is the gray scale value corresponding to the maximum gray scale level displayable by the display panel for which the color reproducibility of the display able color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel; also specifically note col. 4, lines 64-67), and

wherein detecting includes measuring the gray scale level of a color displayed by the display panel (quite clear that the gray scale level displayed by the display panel is measured, this is evidenced by the display color space data (21 in fig. 4 and fig. 5; col. 4, lines 27-67) and the exact clipping of the output gray scale levels when they are no longer reproducible by the display. It is unclear to the Examiner as to how the display color space data and the exact clipping would be performed without any measurements of the gray scale level displayed by the display panel.).

It seems quite clear that the gray scale level displayed by the display panel is being measured, this is evidenced by the display color space data (21 in fig. 4 and fig. 5; col. 4, lines 27-67) and the exact clipping of the output gray scale levels when they are no longer reproducible by the display. It would not have been possible to generate

the display color space data and perform exact clipping without taking measurements of the gray scale level displayed by the display panel.

Yui does not expressly disclose, that the display panel is a LCD panel.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 13, as claim 13 recites identical limitations as claim 2, claim 13 is rejected on the same merits as shown above in claim 2.

With respect to claim 14, as claim 14 recites identical limitations as claim 3, claim 14 is rejected on the same merits as shown above in claim 3.

With respect to claim 16, as claim 12 recites identical limitations as claim 4, claim 16 is rejected on the same merits as shown above in claim 4.

With respect to claim 17, as claim 17 recites identical limitations as claim 8, claim 17 is rejected on the same merits as shown above in claim 8.

With respect to claim 18, as claim 18 recites identical limitations as claim 9, claim 18 is rejected on the same merits as shown above in claim 9.

With respect to claim 20, Yui discloses, the method of claim 19 (see above).

Yui discloses, applying compensated image information to the display device (5 in fig. 4).

Yui does not expressly disclose, that the display panel comprises a plurality of data lines.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48) and applying compensated image information to the plurality of data lines (lines exiting X-driver; 3 in fig. 1).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

16. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786) and further in view of D'Souza et al. (US 7,046,255)

With respect to claim 11, Yui and Kimura disclose, the device of claim 10 (see above).

Yui further discloses, storing gray scale values of the 52nd to the 64th gray scale (col. 5, lines 1-5) level in the lookup table (3,9 in fig. 1).

Neither Yui nor Kimura expressly disclose, mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses, mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.).

D'Souza, Yui and Kimura are analogous because they are all from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui and Kimura.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

17. Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of D'Souza et al. (US 7,046,255)

With respect to claim 23, Yui discloses, the device of claim 19 (see above).

Yui further discloses, storing gray scale values of the 52nd to the 64th gray scale (col. 5, lines 1-5) level in the lookup table (3,9 in fig. 1).

Yui does not expressly disclose, mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses, mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.).

D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
9/25/07

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